DUF_6 Depleted Uranium Hexafluoride Conversion Project	**DUF6-UDS-PLN-110** **Revision 0** **October 2007**

MAINTENANCE PROGRAM DESCRIPTION

Uranium Disposition Services, LLC
Burns and Roe Enterprises, Inc.
Energy*Solutions*, LLC
AREVA NP Inc

U.S. Department of Energy
Portsmouth Paducah Project Office
Portsmouth Site
Paducah Site

Depleted Uranium Hexafluoride Conversion Project

Maintenance Program Description

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Date: 10/19/2007

Approval

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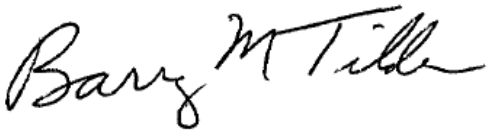

Deputy Project Manager for Operations

Date: 10/19/2007

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DUF6 CONVERSION PROJECT
MAINTENANCE Program Description

Revision Summary

TITLE:	DOCUMENT NO:	REV:
MAINTENANCE PROGRAM DESCRIPTION	DUF6-UDS-PLN-110	0

REVISION DESCRIPTION

- Initial Issue

CONTENTS

ABBREVIATIONS

CFR	Code of Federal Regulations
CM	corrective maintenance
DOE	Department of Energy
DUF_6	depleted uranium hexafluoride
FIMS	Facility Information Management System
ISMS	Integrated Safety Management System
M&TE	measuring and test equipment
MEL	master equipment list
NIST	National Institute of Standards and Technology
^oF	degrees Fahrenheit
PM	preventive maintenance
UDS	Uranium Disposition Services, LLC

INTRODUCTION

The Department of Energy (DOE) awarded contract DE-AC05-02OR22717 to Uranium Disposition Services, LLC (UDS), on August 29, 2002, to construct and operate two facilities that will convert depleted uranium hexafluoride (DUF_6) to uranium oxide for reuse or disposal. These facilities are located in Paducah, Kentucky, and Portsmouth, Ohio. The contract requires that UDS comply with the provisions of DOE Order 433.1A, *Maintenance For Nuclear Facilities*. A high-level description of the maintenance program is provided in DUF6-UDS-PLN-056, *Maintenance Implementation Plan*.

This program description provides a detailed description of the maintenance program at both DUF_6 facilities. The two sites were designed and constructed to be identical, to the maximum extent possible; the only significant difference is that Paducah has four process lines, whereas Portsmouth has three. Therefore, this program description is written for one site, with the understanding that it will be implemented the same way at both sites.

The maintenance program complies with the requirements of DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*, and implements the intent of NQA-1-2000, *Quality Assurance Requirements for Nuclear Facility Applications*, Subpart 2.18, "Quality Assurance Requirements for Maintenance for Nuclear Facilities." Subpart 2.18 is applied in a graded approach.

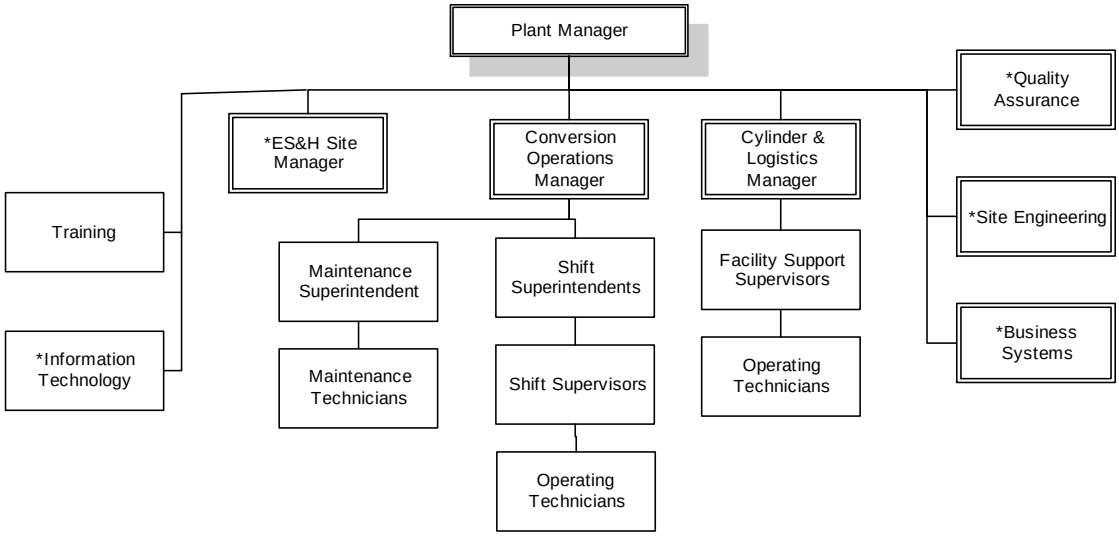
This document is structured to align with DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*, which recommends guidelines for an effective maintenance program. Either the methods and processes used to implement these recommendations are described, or justification is provided as to why they are not being implemented. Appendix A provides a crosswalk between NQA-1, Subpart 2.18, and the implementing sections of this document.

Upon initial approval of this program description, a schedule will be developed to identify actions required to implement fully the strategies and processes.

1 MAINTENANCE ORGANIZATION AND ADMINISTRATION

1.1 Organization Policies

A simplified site organization chart is shown below. Effective implementation of the program is the responsibility of the maintenance superintendent (to whom maintenance personnel report); implementing procedures clearly define responsibilities. Thus, a maintenance organization and policy documents do not need to be developed.



* Functions are matrixed to Plant Manager

1.2 Strategy

Maintenance is integrated into the overall operation of the DUF_6 facility. UDS-U-GFP-0108, *Control of Work,* is the primary document that defines the interfaces between the various organizations whose participation is needed for an effective maintenance program. The effectiveness of this integration is monitored with performance indicators, as discussed in Section 1.6.

Annual long-range planning assures the effectiveness of the maintenance program. Periodically (typically annually), the plant manager, conversion operations manager, and maintenance superintendent evaluate the areas listed below and incorporate the results into future funding requests.

- Recurring major activities
- Planned process line or facility outages
- Major projects and modifications
- Planned organizational structure and staffing changes
- Areas of the maintenance program needing improvement, including:

  - Worker practices during maintenance
  - Training
  - Stores
  - Measuring and test equipment (M&TE)
  - Facility condition inspection program

- Equipment replacement due to end of service life
- Significant equipment failures impacting safety or plant reliability
- Government and industry issues and events impacting the maintenance program
- Budget changes that may divert funding from maintenance activities
- Facility condition inspection results

1.3 Staffing Resources

The maintenance superintendent is responsible for ensuring that adequately trained personnel are available. For non-union personnel, job descriptions identify the entry-level criteria that an individual must meet before being hired by UDS. Mechanical, electrical, and instrumentation craft personnel are required to have a journeyman-level qualification.

To ensure that needed competencies are maintained, ongoing training goals are established. Because UDS is a relatively small organization with a relatively flat organizational structure, career progression planning is not warranted.

1.4 Goals and objectives

During long-range planning (see Section 1.2), goals are established for improving the maintenance program during the next fiscal year. These goals may be added or modified based on input from outside agencies and regulators. The goals are measurable and challenging but achievable. Action plans are developed and tracked using a computerized tracking system. The status of action plans is reported periodically (typically quarterly.) When issues are identified with the maintenance program, these goals may be modified. Additionally, the goals are linked to the performance appraisal system.

1.5 Accountability

A “spot award” program is used to recognize personnel for superior performance; conversely, procedure UDS-HRP-005, *Employee Discipline Procedure*, is used to address performance problems. Non-union personnel receive an annual performance appraisal that identifies areas of performance needing improvement. Goals are also established for reflecting the maintenance organization’s goals for the performance year as well as any personal performance goals.

1.6 Performance Indicators

To monitor and improve performance, charts are established for the indicators such as those listed below:

- Safety, ALARA type performance
- Number of initial event reports written per craft-hours worked
- Number of unplanned line outages
- Number for days of line outages due to maintenance not being completed
- Percent of preventive maintenance (PM) work completed on time
- Hours of corrective maintenance (CM) backlog
- Hours of overtime
- Hours spent on PM versus hours spent on CM

The charts are reviewed and updated monthly; any actions taken to address significant adverse trends are documented.

1.7 Status Report to Managers

The following reports are issued to management at the typical frequency indicated.

Report	Typical Frequency
Surveillances that have entered their grace periods	Weekly
PMs overdue or due in the next 30 days	Weekly
Performance indicators	Monthly
Open action items	Weekly
Action Plans Status	Quarterly

1.8 Root Causes

Procedure UDS-U-QAP-0005, *Condition Reporting*, requires that (1) the root cause be determined for significant conditions adverse to quality and (2) corrective actions (needed to prevent recurrence of the problem) be documented and tracked using a computerized database. UDS-U-QAP-0018, *Root Cause Analysis*, provides directions for conducting analyses.

Potential problems are identified via operating experience; they initially are screened by the UDS compliance officer, who then forwards applicable issues to the maintenance superintendent, who in turn determines whether action is warranted. UDS-U-QAP-0017, *Lessons Learned*, describes this screening process and provides directions for development, issuance, and use of lessons learned.

1.9 Configuration Management

The UDS configuration management policy is established in DUF6-UDS-PLN-023, *Configuration Management Plan*. Procedure UDS-U-EDP-0012 describes the

processes and interfaces needed to change the facility design. In addition, UDS-U-GFP-0108 prevents inadvertent design changes or voiding of seismic qualifications. The current revisions of design documents are available to all personnel via an electronic database, which also identifies approved design change documents that affect the given document. Engineering personnel are responsible for interpreting design-basis requirements.

1.10 Document Control

UDS has implemented an electronic document management system. When a document is completed and approved, it is forwarded to Document Management in accordance with UDS-U-DMP-0001, *Document Control*. It is then indexed, scanned, and uploaded to a computerized database. Employees can then retrieve the document from any UDS networked computer. Strict controls are in place to prevent a revision to, or deletion of, a document without the required review and approval. The database is structured such that only the current approved version is readily available.

1.11 Procedures

Maintenance procedures are prepared, reviewed, and approved in accordance with UDS-U-QAP-0003, which also establishes the process for periodic review. Once approved, procedures are controlled as described in Sections 1.10 and 5.5. Procedure templates have been developed to ensure a consistent format.

1.12 Drawing Control

Drawings are prepared and approved per UDS-EDI-003. They are controlled via an electronic document management system, as described in Section 1.10. When a drawing is retrieved from the system, any design change documents affecting the drawing are identified.

1.13 Vendor Information

Vendor manuals are controlled in the same manner as other UDS documents (see Section 1.10). Vendor information is used as appropriate to develop maintenance procedures and work instructions. Revisions to vendor information are evaluated to determine whether procedures or instructions should be changed.

1.14 Records

Records are controlled in accordance with UDS-U-DMP-0002, *Records Management*. Maintenance records include work orders and associated procedures or instructions. The records identify (as applicable):

- Equipment on which maintenance was performed
- Type of maintenance performed
- M&TE used
- Parts and materials used

- Date on which the work was performed
- Post maintenance test/inspection information
- Failure cause code
- Identity of the personnel who performed the work

2 TRAINING AND QUALIFICATION OF MAINTENANCE PERSONNEL

2.1 Responsibilities

The maintenance superintendent ensures that personnel are properly trained and can perform work safely and effectively. The training supervisor assigns personnel to administer training and provides technical support to ensure that training activities comply with applicable DOE orders and regulatory requirements.

2.2 Maintenance Training Program

The maintenance training program is developed, implemented, and maintained in accordance with UDS-U-TRN-0001 and fully complies with DOE O 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.

2.3 On-the-Job Training

UDS-U-TRN-0005 establishes an on-the-job training process, which includes use of a qualified trainer and supervision, direct supervision of the trainee(s), and limits on the number of trainees.

2.4 Qualification

UDS-U-TRN-0001 addresses maintenance qualifications, which include demonstrations of required knowledge.

2.5 Root Cause Training

UDS-U-QAP-0018 describes root cause analysis; it addresses using personnel trained in root cause analysis and assigning personnel with an appropriate level of knowledge to the analysis team.

2.6 Program Approval Effectiveness and Feedback

The effectiveness of the training program is evaluated annually, in accordance with UDS-U-TRN-0006, *Training Evaluation*. The evaluation is performed in conjunction with long-range planning activities (see Section 1.2) and includes:

- Evaluation of the program by the maintenance superintendent
- Receipt of feedback from trainees
- Evaluation of equipment and procedural changes

- Evaluation of personnel performance

2.7 Supervisory Training

Managers and supervisors meet the training and experience requirements in DOE O 5480.20A. Maintenance supervision receives training in accordance with UDS-U-TRN-0001. Typical, training elements include:

- Integrated Safety Management System (ISMS)
- Leadership
- Fitness for duty
- Administrative policies and procedures
- Facility security and emergency plans
- Facility modifications
- Nuclear, industrial, and radiological safety

3 FACILITY, EQUIPMENT, AND TOOLS

3.1 Shops

Process equipment that may be radioactively contaminated is maintained in the conversion building (C/X-1300) shop, which contains a jib crane, welding equipment, and drill presses as well as hand tools needed to troubleshoot and repair process equipment. A dedicated ventilation system controls temperature in the shop and minimizes the potential for a buildup of radioactive airborne contamination. A second shop, in the C/X-1700 warehouse, is used for maintaining uncontaminated equipment, which is significantly less cumbersome and complex than process equipment. Thus, the warehouse shop is equipped with only hand tools, is heated, and has ventilation to control temperature in the summer.

3.2 Lay-Down and Staging Areas

The amount and type of maintenance performed does not warrant a plan for lay-down and staging areas; rather, these areas will be established on a case-by-case basis.

3.3 Storage Facilities

The primary area for storing supplies and spare parts is the C/X-1700 warehouse, which is heated and has ventilation to control temperature in the summer (to maximize the shelf life of material). The receiving dock lies adjacent to this area, to facilitate material receipt and inspection.

3.4 Temporary Facilities

The potential for spread of radioactive contamination increases significantly when some process equipment is opened. To reduce this potential, temporary containment structures will be used. Large temporary structures are not expected to be needed; however, if one were needed, it would be fabricated and installed in accordance with

UDS-U-GFP-0108, to ensure that appropriate engineering considerations were taken into account to prevent the overloading of building services.

3.5 Decontamination Facilities

The conversion building shop contains an ultrasonic sink for decontaminating tools and equipment; use of this sink will reduce the amount of radioactive waste generated as well as personnel exposures. To reduce further generated radioactive waste, water from the sink is transferred to an evaporator where most of the water is removed.

3.6 Tool and Equipment Storage

The conversion building and warehouse maintenance shops have adequate space for storing daily-use tools as well as special tools and rigging equipment. Additionally, carts are used to transport tools to the work location safely and efficiently.

3.7 Office Equipment

Maintenance offices are located primarily on the second floor of the conversion building, in a non-contaminated administrative area and in the warehouse/maintenance shop equipped with phones, copiers, and printers as well as access to the UDS computer network. These areas are sized to handle the increased activity that occurs during outages.

4 TYPES OF MAINTENANCE

4.1 Master Equipment List

A master equipment list (MEL) is integrated into the computerized work order system. Information provided for each component includes:

- Component identification number
- Component description
- System identification
- Safety classification
- Type of component
- Seismic and natural phenomenon categories
- Drawing reference(s)

4.2 Preventative Maintenance

PM planning and performance are addressed in UDS-U-GFP-0108. PM is optimized to maximize availability of equipment, based on the equipment's importance to safety and facility operations as well as the cost of the component's replacement. PMs are tracked and scheduled using a computerized work order system, which takes into account plant conditions and the availability of resources. Periodic (typically weekly) reports are issued to management identifying PMs that are overdue or coming due. Section 4.6 addresses improvements to the PM program.

PM activities are performed in accordance with written instructions. Based on the complexity of the task, the instructions can be contained entirely in the work order or in documents that are referenced and attached to the work order

4.3 Problem Component Analysis

When a component important to safety or plant reliability fails unexpectedly, a functional failure analysis is performed to identify needed PM changes. The processes described in DOE G 433.1-1 and NQA-1 will be utilized, and include:

- Component boundary determination
- Component history review
- Selection of analysis technique
- Determination of functional failures
- Determination of failure modes and effects

4.4 System Analysis

A system analysis may be performed when plant reliability needs improvement or resources need optimization. The process described in DOE G 433.1-1 will be followed and includes:

- Selecting and prioritizing systems
- Evaluating system
- Collecting data
- Determining boundary
- Determining system and subsystem functions
- Determining functional failures
- Selecting critical equipment and instruments
- Strategizing analysis
- Determining failure modes and effects
- Reviewing history
- Conducting logic tree analysis

4.5 Preventative Maintenance Task Selection

PM is categorized into the following:

- *Time dependent*: Performed on a fixed schedule.
- *Condition monitoring*: Identifies the need for maintenance prior to failure.
- *Surveillance*: Performed to confirm operability of equipment (if a failure is identified, CM is performed).

PM frequencies are based on:

- Vendor recommendations
- Importance of the component to safety and plant availability
- Commitments in the safety basis or regulatory documents

- Operating experience

"Time dependent" and "surveillance" maintenance comprise almost all PMs performed. Maintenance that is performed as needed, when a condition or the performance of a component has reached a predefined limit or standard, CM is performed to repair it.

4.6 Preventative Maintenance Program Review

The effectiveness of PM will be evaluated annually in conjunction with long-range planning, as described in Section 1.2. The evaluation will consider the following sources of information:

- Equipment failure trending (see Section 4.8)
- Causes of failures
- Worker feedback
- System performance
- Equipment history
- Task frequency optimization (see Section 4.7)

4.7 Task Frequency Optimization

Engineering reviews PM and CM results. PM may be scheduled more frequently to extend the service life of the component, or a planned replacement of the component may be performed. Alternatively, if the component's condition is not degrading, some PMs may be extended or deleted.

4.8 Component Failure Trending

When performing CM, the worker documents as-found conditions to help determine the cause of failure. A failure cause code is assigned and recorded in the computerized maintenance work order system. Engineering personnel monitor CM results and, if needed, adjust PM frequencies for a particular component.

4.9 Predictive Maintenance

Due to the types and costs of equipment affecting facility safety and availability, general use of predictive maintenance is not warranted.

4.10 Corrective Maintenance

CM to address equipment failures is planned and executed in accordance with UDS-U-GFP-0108, which ensures that (1) ISMS principles are effectively incorporated into CM planning and execution and (2) the authorization basis is not violated. The procedure requires workers to record as-found information to help identify causes of failure.

5 MAINTENANCE PROCEDURES

Procedures are developed for maintenance surveillances and selected complex or high-risk activities. All other maintenance work will be performed in accordance with job instructions developed through the work order process as described in Section 7.

5.1 Procedure Development and Writing

Procedures for surveillances and selected complex or high-risk activities are developed, reviewed, and approved in accordance with UDS-U-QAP-0003, which ensures that directions provided to workers are technically correct and contain an appropriate level of detail.

5.2 Procedure Verification and Validation

UDS-U-QAP-0003 requires reviewers to determine the technical acceptability and usability of procedures.

5.3 Procedure Approval

UDS-U-QAP-0003 requires managers to review and concur on procedures pertaining to their areas of responsibility.

5.4 Procedure Use

Both the UDS quality assurance program and the integrated safety management program require compliance with approved documents; otherwise, work must be stopped and the equipment placed in a safe condition. Section 1.10 of this plan describes the methods used to ensure that personnel have access to the most current, approved version of a procedure.

5.5 Procedure Change Control, Periodic Review, and Revision

UDS-U-QAP-0003 requires that procedures be reviewed at least every 2 years to ensure technical accuracy and to determine whether requirements still apply.

6 PLANNING, SCHEDULING, AND COORDINATING

6.1 Organization

The work control planner reports to the maintenance superintendent, who is experienced in the planning and performance of nuclear maintenance activities. The size and complexity of the conversion facility do not warrant a separate planning group.

6.2 Work Control Planner Responsibilities

The work control planner works with the maintenance superintendent or facility manager to determine the scope of work and then prepares a work order (see UDS-U-GFP-0108), which includes:

- Entering information into the computerized work order system
- Obtaining the required approvals for planned work
- Updating the computerized work order system upon work completion

6.3 Craft Skills

Because of the size of the maintenance organization, the work control planner has a good understanding of the knowledge, skills, and capability of craft personnel. Based on this knowledge, as well as the risk and complexity of the work, the planner incorporates the appropriate level of detail into job instructions. Review by the maintenance superintendent or supervisor assures an appropriate balance between use of written directions versus skill of the craft to complete work safely and effectively.

Supervision supplements the skills and knowledge of craft personnel through pre-job briefings, direct oversight, and post-job reviews (when appropriate).

6.4 Planning System

UDS-U-GFP-0108 ensures that the following processes are integrated effectively:

- Work planning, scheduling, and execution
- Post-maintenance testing
- Work-order closeout

6.5 Work Control Program

Work planning is integrated into the work control process as described in UDS-U-GFP-0108, to ensure that maintenance activities do not violate the documented safety analysis or technical safety requirements for the facility.

6.6 Work Request Processing

The computerized work order system enables any individual to identify a maintenance deficiency, initiate a work request, and recommend a priority for the work. Operations Conduct of Operations manual require deficiencies to be reported to an on-shift superintendent, who log the deficiencies, evaluate impacts on operations and assures a deficiency tag is hung.

The work control planner queries the system to identify requests and then, in conjunction with the maintenance superintendent or facility manager, determines the scope of the work order.

6.7 Work Order Planning

The work control planner performs the following, as appropriate, to prepare a work order:

- Reviews equipment history to determine whether similar work was performed
- Prepares a hazard assessment per UDS-U-SHP-0211, *Hazard Assessment*
- Obtains engineering input

- Reviews vendor manuals
- Determines tools and equipment needed to complete the work
- Identifies needed parts and materials
- Identifies applicable activity hazard analyses, needed permits, and special safety controls
- Determines the level of detail needed in job instructions
- Determines the craft resources for each job step
- Obtains information regarding post-maintenance testing requirements

6.8 Backlog

A CM backlog goal of 4 to 6 weeks will be maintained for each craft. This allows sufficient time for routine work requests to be planned, parts to be ordered, and the work to be scheduled so that it has minimal impact on plant operations. Emergent critical work items will be worked ahead of routine backlog work as needed to ensure plant performance goals are achieved.

6.9 Scheduling Maintenance Activities

The computerized work order system enables work to be scheduled efficiently and effectively. Periodic (typically weekly) reports issued to managers identify PMs due in the next 30 days. The work order system also can quickly identify which work orders apply to a given component (so if an unplanned outage of the component occurs, other scheduled work on the component can be performed).

Work is scheduled based on priority, which initially is established when a work order is started. The following priority categories apply:

- *Critical*: The work is needed to address a significant event that either *is* occurring or has a high *probability* of occurring (e.g., site emergencies, a leaking hydrogen fluoride storage tank, etc.).
- *Necessary*: The work must be completed by a specified date.
- *Routine*: The work will be completed based on available resources.
- *Outage*: The work will be completed the next time the component is taken out of service.
- *Return to service*: The work must be completed before an out-of-service component can be returned to service.

In addition to these categories, the following equipment classifications are used to determine priority in which work on higher safety category receives a higher priority:

- Safety significant
- Production support
- General support

Maintenance work is scheduled primarily based on priority, the availability of resources, and the occurrence of plant conditions needed to perform the work. The work is

scheduled far enough in advance to facilitate coordination of equipment, materials, and personnel. Types of schedules used include:

- *Long range*: Identifies work scheduled to be completed 30 or more days in the future. This schedule allows for resource leveling and procurement of equipment or material with long lead times.
- *Weekly*: Identifies work orders scheduled to be completed in the next 7 days. This schedule allows for:
  - Placing the facility in the needed operational condition
  - Coordinating support personnel (engineering, safety, and quality assurance)
  - Issuing needed permits and tagouts
  - Preparing parts and materials
- *Daily*: Identifies work orders scheduled to be performed in the next 24 hours. This schedule is used during shift briefings and accommodates final adjustments.

Schedules are issued to all organizations that support, or are impacted by, maintenance activities. Long term and weekly schedules are updated at least every 7 days; daily schedules are not updated.

6.10 Coordinating Maintenance Activities

The computerized work order system can easily sort all open work orders, by criteria such as priority, impacted systems, process line numbers, and scheduled completion dates. The system can also reserve parts (in the warehouse system) or generates purchase requisitions. Due to the close proximity of the warehouse to the facility, parts typically are not pre-staged at the work site.

The following meetings are typically held between operations and maintenance personnel, to coordinate work and resolve problems.

- *Weekly*: Determine which work orders will be placed on the weekly schedule.
- *Daily*: Determine whether any work orders on the daily schedule need redirection, and determine which work orders will be placed on the next daily schedule.

6.11 Planning, Scheduling, and Coordinating Outages

Work orders that must be completed during an outage are identified with a specific priority code. Due to the number and complexity of these work orders, planning, scheduling and coordination activities are managed with the same systems already discussed in this section.

6.12 Planning, Scheduling, and Coordinating Maintenance Monitoring

Section 1.6 describes performance indicators for maintenance planning, scheduling, and coordination.

7 CONTROL OF MAINTENANCE ACTIVITIES

7.1 Work Control Procedure

All maintenance activities (including surveillances) are performed in accordance with UDS-U-GFP-0108, which addresses the following:

- Initiating a work request
- Monitoring the work
- Planning and approving work orders
- Scheduling work
- Identifying needed permits
- Identifying post-maintenance test requirements (when applicable)
- Collecting information for maintenance history

7.2 Work Request/Work Order

The computerized work order form used for maintenance activities addresses most of the items listed in Paragraph 4.7.3.2 of DOE G 433.1, which are recommended to be included in a work control document. Technical safety requirements is not included on the work order since operations has processes to ensure that appropriate limiting conditions of operation are implemented when required. If needed, the work request will identify the date by which the maintenance must be completed.

7.3 Supervision of Maintenance Activities

Procedure UDS-U-GFP-0108 clearly identifies the supervisor as the individual responsible for safe and effective work performance. The supervisor must:

- Ensure personnel are appropriately trained
- Perform pre-job briefings
- Periodically monitor work
- Ensure compliance with work order requirements
- Document the completion of work

7.4 Review of Completed Work Request

Performance of post-maintenance testing is performed as described in Section 8. The supervisor is the last signature in the work order process; this signature signifies that:

- Work has been performed correctly
- Any required testing has been completed
- All required documentation has been completed correctly
- The work site has been inspected

7.5 Control of Non-UDS Personnel

Non-UDS personnel normally are used for only specialized maintenance activities, when development of in-house expertise is not warranted. Work performed by non-UDS personnel will be controlled in accordance with UDS-U-GFP-0108 to ensure that such personnel have the competencies needed to perform the work and that work instructions are adequate.

7.6 Equipment

PM levels initially are determined based on vendor recommendations and the importance of the equipment to facility safety and reliability. As discussed on Section 4.6, PM frequencies are re-assessed annually (and adjusted if needed).

7.7 Equipment Analysis

Section 4.3 addresses failure analysis.

7.8 Performance Monitoring

A performance monitoring program is designed to detect equipment degradation through routine testing. Performance monitoring is performed on vital equipment required for safe shutdown or whose failure would result in immediate facility shutdown which benefits from this type of testing.

7.9 Configuration Management

DUF6-UDS-PLN-023 addresses configuration management requirements.

7.10 Conduct of Operations

DOE O 4320.19, *Conduct of Operations*, is implemented via the Conduct of Operations manual and "conduct of" procedures referenced in UDS-U-GFP-0101. Additionally, UDS-U-GFP-0108 requires that the facility manager authorizes maintenance activities and verify that those activities will comply with requirements of the documented safety analysis.

7.11 Cleanliness Control

During maintenance activities, controls are implemented to prevent the introduction of contamination into piping or components. If piping or components are replaced, then flushing is performed to ensure that contamination and foreign materials are removed.

7.12 Health and Safety

Implementation of ISMS is described in DUF6-UDS-PLN-040, *Integrated Safety Management System – Operations*. This document ensures compliance with:

- 10 Code of Federal Regulations (CFR) 830, *Nuclear Safety Management*, Subpart A, "Quality Assurance Requirements"

- 48 CFR 970.5223-1, “Integration of environment, safety, and health into work planning and execution”
- DOE O 450.1, Environmental Protection Program.

DUF6-U-UDS-PLN-074, *Worker Safety and Health Program*, describes the process used to ensure compliance with 10 CFR 851.

Procedure UDS-U-GFP-0108 ensures that ISMS principles and elements, as well as worker health and safety requirements, are implemented during performance of maintenance activities.

7.13 Human Factors Engineering

Human factors were considered during the design of the DUF_6 facility, to reduce the potential for failures caused by personnel errors. When components were turned over from Construction, a walkdown was performed—partly to ensure maintainability of the equipment. Human factors are considered when planning work.

8 POST-MAINTENANCE TESTING

8.1 Requirements for Post-Maintenance Testing

The work control process requires Engineering to provide post-maintenance testing requirements (to verify that components can still perform their design functions as required by the documented safety analysis). The process for developing and performing post-maintenance testing requirements is addressed in UDS-U-PEP-1004, *Post-Maintenance Testing*. Once PMT requirements are established, they are incorporated into the work order (or the work order references the applicable surveillance or test procedure) and are implemented as described in UDS-U-GFP-0108.

8.2 Scope of Post-Maintenance Testing

Post-maintenance tests are performed for all safety-significant components when maintenance is performed affecting its operability, tests will be performed on process support and general support components according to:

- The importance to production
- The complexity of the maintenance activity
- The ability to detect problems after components are placed into operation
- The potential cost if the work were performed incorrectly

8.3 Control of Post-Maintenance Testing

Post-maintenance tests are performed after the maintenance activity is completed but before the equipment is declared operable. Per UDS-U-GFP-0108, a work order cannot be closed until any required test has been completed. UDS-U-PEP-1004 defines when and how the PMT control form is used.

8.4 Documentation and Acceptance of Post-Maintenance Testing

The results of post-maintenance tests are documented either as part of the work order or as part of the surveillance or test procedure referenced by the work order. Per UDS-U-GFP-0108, Engineering determines the acceptability of the test results, and the facility manager determines whether the components are operable (which also includes evaluating any test results).

9 PROCUREMENT OF PARTS, MATERIALS, AND SERVICES

9.1 Procurement Policy and Procedures

The primary procedures governing the procurement of parts, materials, and services are listed below; they establish the procurement process and identify personnel responsibilities with regard to procurement of all items:

- UDS-PRP-007, *Blanket Purchase Orders*
- UDS-PRP-008, *Request for Proposal*
- UDS-PRP-010, *Pre-Award Survey*
- UDS-PRP-012, *Technical Evaluation of Proposals*
- UDS-PRP-016, *Processing Contractor Releases and Notification of Hold Points*
- UDS-PRP-022, *Material Receipt Control*
- UDS-U-PRP-0002, *Purchase Requisition*

Additionally, UDS-U-EDP-0012 ensures that stocking levels are changed, and outdated or obsolete parts are removed, as part of the design-change process.

9.2 Procurement Initiation

To maximize facility availability, a spare-parts inventory was developed during initial startup; inventory requirements are based on vendor technical documents, industry experience, and the following considerations:

- Long-lead items
- Cost of items
- Shelf life
- Components whose failure would result in immediate facility shutdown
- PM requirements while in storage
- Ability to obtain parts from the other DUF_6 facility

Additionally, vendors have been identified and single-source items justified, minimizing procurement delays for replacement parts.

9.3 Procurement Controls

Section 9.1 describes procurement-process controls; Section 10 describes the process to ensure that items are controlled adequately after their arrival on site.

10 MATERIAL CONTROL

10.1 Receipt and Inspection

The warehouse/maintenance building has a loading dock to enable safe and efficient receipt of equipment and material. Acceptance activities are performed at a receiving area near the loading dock; an additional area is designated for storage of unacceptable items. The storage area of the warehouse is heated and has ventilation to control temperatures in the summer.

UDS-U-PRP-0022, *Material Receipt Control*, defines the process to ensure that an item meets predetermined acceptance requirements. Engineering identifies critical parameters to ensure that an item will perform its design function; quality assurance determines the method(s) for ensuring that the parameters are met. When the item is received, Stores personnel ensure that the parameters have been verified before placing the item into storage. The computerized stores system is then updated with:

- Location of item
- Lot number (if applicable)
- Shelf life expiration date (if applicable)
- PM requirements while is storage (if any)
- Storage requirements

10.2 Handling

Large quantities of material are normally moved in accordance with UDS-SHP-213, *Industrialized Motorized Trucks*; if lifting activities are involved, then UDS-SHP-203, *Hoisting and Rigging*, is implemented. Both of these procedures ensure that equipment is properly maintained and operated by qualified personnel, within appropriate safety controls. If special controls are needed to protect an item from damage during movement, then a work order is generated.

10.3 Storing Material and Equipment

Material is stored in a manner that prevents degradation. To this end, PM is performed on stored parts; the PM is tracked using the computerized work order system, which also tracks shelf life due dates (to enable removal of expired materials, and reordering when needed). The storage area is inspected monthly to ensure that required conditions are maintained.

10.4 Retrieval and Issuance

As discussed in Section 10.1, the computerized stores system maintains inventory information. This system interfaces with the electronic work order system, so the availability of parts and materials can be determined immediately.

Procedure UDS-U-PRP-0022 establishes the process for parts retrieval, acceptance, and issuance (the procedure also ensures that parts are *not* issued until they have been accepted for use). As part of the issuance process, the identification number of the

work order for which the parts are being issued is recorded in the electronic work order system, which ensures traceability between component procurement and installation. If available lot number information is also recorded. Based on this, "issuance documentation" is not maintained as a quality record.

11 CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT

UDS-U-PEP-2001 establishes the overall program for control, calibration, and use of M&TE.

11.1 Procurement

Requests for M&TE devices and services are processed through the maintenance superintendent. Requests are evaluated for consistency with existing inventory, support requirements, accuracy, and reliability of intended use *before* being sent to Procurement.

11.2 Identification

Each piece of M&TE will be assigned a unique identification number that will be marked on it permanently or attached to it. These numbers help identify, trace, and control M&TE. The computerized work order system will be used to control M&TE and to provide calibration and history information. The system will include the information listed below. Those items with an asterisk also will be included on the instrument.

- Generic description, trade or marketing name, manufacturer, model, and serial number
- Unique identification number*
- Range(s) and accuracy
- Calibration frequency/interval
- Calibration date*
- Calibration expiration date*
- Usage records

11.3 Records

As discussed in Section 15, the computerized work order system will be used to maintain the history of M&TE, including M&TE removed from use. In addition to the information listed in Section 11.2, the history of calibrations, repairs, restrictions on use, and calibration out-of-tolerance evaluations will be maintained in the computer system. Use history information will be maintained as a hard-copy record. Manufacturers' information manuals and supplemental bulletins are maintained as described in Section 1.10.

11.4 Calibration

Only standards traceable to the National Institute of Standards and Technology (NIST) or other nationally recognized standards organizations are used for calibration of M&TE. M&TE is calibrated using reference standards (secondary or working), the calibration of which has a known valid relationship to nationally recognized standards or accepted values of natural physical constants. If national standards do not exist, the basis for calibration is documented and approved by engineering. The reference standard used will have at least four times greater accuracy than the device under test. If this accuracy ratio cannot be met, analysis of the errors is estimated to provide a valid uncertainty of the calibration process. If repair or calibration of a standard is necessary, the recalibration is traceable to NIST or to the standard of record. Calibration standards maintained at the facility are kept in designated storage locations. If calibration standards are issued for field use, the supervisor responsible for them authorizes, and minimizes, the period of issuance (laboratory standards normally are not issued for field use). Standards are calibrated on a frequency consistent with vendor recommendations and facility experience. Calibration records for standards are consistent with those of all other M&TE.

Calibration of equipment on site is performed by qualified technicians using approved written directions that address the following:

- Precautions or limitations
- Calibration standards to be used, and their accuracy levels
- Calibration instructions and data sheets for as-found and as-left data
- Acceptance criteria for each scale, expressed as a range (and in the units that are being measured)

M&TE may be calibrated by off-site organizations that have been approved in accordance with quality assurance procedures. Purchase orders to these organizations reference or include the following:

- Tolerance requirements
- Calibration test data requirements
- Any special environmental, handling, and shipping requirements
- Calibration data to be supplied with the calibrated equipment
- Requirement to provide immediate notification if as-found data do not meet acceptance criteria
- Requirement to tag the M&TE with the calibration date and due date

The calibration interval (period between calibrations) is established as a quality objective for M&TE and is based on the manufacturer's specifications. Exceptions may be established based on equipment type, stability characteristics, accuracy requirements, intended use, past performance, and other conditions affecting measurement control.

11.5 Control

The computerized work order system is used to ensure that M&TE is calibrated when required. Additionally, personnel verify that the M&TE is within its calibration date interval prior to each use; a log is maintained to identify which work orders a piece of M&TE was used on. Thus, a separate recall system is not needed.

Steps are taken to prevent radioactive contamination of M&TE. M&TE is stored in the same areas as other specialized maintenance tools and equipment (see Section 12); M&TE that has expired or has been damaged is placed in a marked, segregated area. M&TE that is easily damaged will be stored and transported in cases and/or special rigs.

11.6 Evaluation

Calibration data are reviewed, and M&TE is tagged per one of the following:

- Calibration date, calibration due date, and signature
- "Limited Calibration" label with calibration date, calibration due date, and limited-use information
- "Do Not Use" label, with M&TE identification number and current date

When an M&TE device is suspected or found to be out of calibration, defective, or otherwise unreliable, a condition report is initiated to determine what action is needed, including evaluation (for acceptability) of any results where the instrument has been used since it was last found to be in calibration.

Results of M&TE calibrations are trended; the trends are used to identify needed corrections or changes to the M&TE program, such as adding or deleting M&TE devices, adjusting calibration frequencies, correcting procedures, or upgrading M&TE quality.

12 MAINTENANCE TOOLS AND EQUIPMENT CONTROL

12.1 Storage and Issuance

There are two equipment and tool storage areas: the warehouse/maintenance building, and the maintenance shop area of the conversion building. Job aid UDS-AD-133 provides directions for inventorying, issuing, and tracking tools stored in the tool cribs and establishes the process for performing an annual inventory of tools (including hoisting and rigging accessories). Tools that exceed $250 in value or that require routine maintenance or inspections will be serialized uniquely. Personnel will be indoctrinated on the importance of maintaining tool accountability.

12.2 Tool and Equipment Maintenance

Vendor manual recommendations, Occupational Safety and Health Administration requirements, and DOE requirements are used to evaluate PM needs. The computerized work order system tracks and documents PM as well as required

inspections and tests. Personnel are trained on the need to check equipment, prior to each use, for safety or usability issues. Job aid UDS-AD-133 requires all defective equipment to be tagged and segregated (if possible) to prevent use.

12.3 Use of Special Tools and Equipment

Few special tools, equipment, and test rigs requiring detail operating instructions are used at DUF_6 facilities. If one is used, the work order governing the maintenance activity provides written directions to ensure safe and effective use. Section 2 describes the processes for ensuring that personnel have the needed skills to use, safely and effectively, such equipment. Mockups may be used for complex high risk maintenance activities.

UDS-SHP-203 specifies requirements for the safe operation of hoisting and rigging equipment used in maintenance activities. Further, the work order or governing procedure for the activity contains written directions to ensure effective implementation of these requirements.

12.4 Tools and Equipment in Radiological Areas

Due to the configuration of the conversion building, a radiological buffer area is established in all process areas. Tools in the conversion building crib are identified with paint or labels, as are any tool boxes or craft boxes. Before tools are permanently removed from the buffer area, they are radiologically free released and the paint or label is removed or covered with green paint. Based on the level of activity, staffing the tool crib (to check equipment in and out) is generally not used.

Items used in a posted contamination area are surveyed prior to removal from the area. If contamination cannot be removed, then the item is bagged prior to removal and remains bagged when returned to the tool crib.

13 FACILITY CONDITION INSPECTIONS

13.1 Standards

Facilities are inspected regularly to ensure that they are being maintained in an acceptable condition. These inspections are conducted by managers, engineers, and workers. Indicators checked include:

- No leakage from equipment
- No damage to equipment or structures
- Gauges operating and calibrated
- Protective doors and covers installed
- Equipment properly insulated
- Paint/sealant in good condition
- Entrances, egress, pathways, and equipment access maintained
- Housekeeping adequate
- Shop and tool rooms in orderly condition, and equipment properly protected

- Illumination adequate
- Combustible loading acceptable

13.2 Operators

During the performance of operating equipment, personnel are continually evaluating the condition of the facility. Operator round sheets assures that indicators such as leaks are checked.

13.3 System Engineers

System engineers are responsible for assessing the condition of equipment for which they are assigned. This includes visual inspections.

13.4 Operations Supervisors and Superintendent

Operations superintendent s and supervisors routinely walk down the facility during their assigned shift.

13.5 Facility Information Management System

DOE O 430.1B, *Real Property Asset Management*, provides a performance-based approach to the life-cycle management of DOE property. Information regarding the condition of DOE facilities is recorded in the Facility Information Management System (FIMS) database, which applies only to real property such as buildings and their support systems (e.g., ventilation); FIMS does *not* apply to process equipment.

14 MANAGEMENT INVOLVEMENT

14.1 Manager Involvement

Procedure UDS-U-QAP-0013, *Management Assessment*, establishes the process and frequencies for corporate managers to evaluate performance in their areas of responsibility. Per this procedure, the conversion operations manager and the maintenance superintendent also assess ongoing maintenance activities at least twice a month. These assessments focus on the adequacy of the work order or procedure governing the work, and implementation of ISMS. Violations of established requirements identified during these assessments are documented in accordance with UDS-U-QAP-0005.

14.2 Performance Indicators Goals and Objectives

Section 1 describes the establishment, measurement, and review of performance indicators, goals, and objectives.

14.3 Problem Analysis

Section 16 describes the method for analyzing unplanned, recurring, and persistent maintenance problems, incidents, and outages.

14.4 Information Collection

Failure codes are established for all CM activities and are recorded on the work order. Engineering uses this information, along with operational data, for trending and evaluations.

14.5 Information Analysis

Sections 1.8 and 4.3 describe the process used to evaluate problems identified by managers and to determine appropriate actions.

14.6 Corrective Action Follow-Up

If a manager's assessment identified a problem requiring CM, a post-maintenance test is performed (if warranted) to ensure the problem was corrected.

14.7 Generic Follow-Up

The procedures for work orders, condition reporting, and occurrence reporting all implement the lessons learned program. UDS-U-QAP-0017 describes the process to ensure that lessons learned are communicated to other DOE sites and are evaluated for applicability and implementation at DUF_6 facilities.

14.8 Feedback

The plant manager meets regularly with site personnel to solicit their feedback on ways to improve safety and performance. Per UDS-U-GFP-0108, workers are involved in, and encouraged to provide input to, the planning of work. They are also required to document on the work order any suggestions for improvement.

14.9 Program Reviews

The effectiveness of the maintenance program is included in the assessment described in Section 1.2. Additionally, an independent assessment is performed by Quality Assurance periodically (typically annually.) The results of these assessments are reported to senior management.

15 MAINTENANCE HISTORY

15.1 Program Development

Maintenance history information is maintained in the computerized work order system for equipment based on its importance, complexity, safety significance, failure history and other factors.

15.2 Data Collection

Maintenance history information is collected automatically during the scoping, planning, and execution of maintenance activities (through the use of the computerized work

order system). Additional information, such as vendor bulletins and problem analyses, are electronically linked to the component in the master equipment list, which is part of the computerized system.

15.3 Maintenance History File Development

As discussed in Section 15.1, a maintenance history file is maintained electronically and may be printed out as needed.

15.4 Program Use

The computerized work order system is located on computer servers accessible to all UDS personnel. Thus, planners can easily access information from previous work orders—such as special tools needed, job instructions, and time required. The information also is available to engineering personnel for review per UDS-U-PEP-1009, *System Engineering*. (These engineering reviews are performed at least every 2 years.)

15.5 Computerized Maintenance History

As discussed elsewhere in this Section, the computerized work order system provides the functionality of a maintenance history file.

16 ANALYSIS OF MAINTENANCE PROBLEMS

16.1 Information Collection

In accordance with UDS-U-QAP-0018, information is collected by the individual or team assigned to determine the cause of an unplanned occurrence that had an adverse impact on safety or plant reliability. Information collected includes:

- Equipment history
- Personnel interviews
- Vendor manuals
- Training records

16.2 Event Analysis

Procedure UDS-U-QAP-0018 establishes the general process for analyzing events; Section 4.3 describes the specific process used to analyze a component failure.

16.3 Cause Determination

Procedure UDS-U-QAP-0018 identifies when to use a specific analytical method and also lists DOE cause codes.

16.4 Corrective Action

Based on analysis and resulting root cause determination, actions are initiated to prevent a problem from recurring. Additionally, the individual responsible for completing the action is identified, as is the due date; this information is entered into a computerized tracking program.

16.5 Corrective Action Follow-Up

If the corrective action is to fix an equipment problem, UDS-U-GFP-0108 addresses the performance of post-maintenance testing. If needed, additional actions are entered into the tracking program, to ensure that the problem has been corrected.

16.6 Generic Follow-Up

Significant failures are evaluated as part of the annual long-range planning described in Section 1.2; the results of these evaluations are incorporated into goals and objectives, as described in Section 1.4.

16.7 Periodic Review

Per UDS-U-PEP-1003, engineering performs a biennial review to determine whether equipment is degrading or becoming obsolete.

17 MODIFICATION WORK

17.1 Interfaces

Controls are established in UDS-U-GFP-0108 to ensure that maintenance activities do not result in unapproved modifications. During the planning process, a specific determination is made to ensure that the work will not result in a design change. Workers are required to stop work if the model number or part number of the item being installed differs from the original.

17.2 Temporary Repairs or Temporary Modifications

UDS-U-PEP-1010, addresses temporary modifications. This procedure establishes a logging system and requires review every 6 months to determine whether a temporary modification should be made permanent.

17.3 Limitation and Precautions

Temporary modifications are installed per a written and approved work order as described in UDS-U-GFP-0108. This procedure ensures that hazards such as energized circuits are adequately controlled.

17.4 Request and Description

The process for requesting a temporary modification is addressed in UDS-U-PEP-1010, which includes a form for recording information such as:

- Affected equipment
- Reason for the modification
- Expected duration of the modification
- Affected design documents
- Type of modification (e.g., lifted lead/jumper, disabled alarm, mechanical jumper)

17.5 Evaluation

Engineering personnel evaluate the requested modification to (1) ensure it can be implemented safely, (2) ensure it does not adversely impact the functions of safety significant components, and (3) determine post-maintenance testing requirements (to ensure the modification is installed correctly). Then, an "unreviewed safety question" review is performed in accordance with UDS-U-NSP-0002.

17.6 Installation

Before placing a temporary modification into operation, the facility manager verifies the following:

- Updating of the temporary-modification log and form
- Compatibility with existing plant conditions
- Identification of modification in the field
- Updating of applicable design documents and procedures
- Completion and acceptance of functional tests

Installation of the modification is communicated to affected personnel in accordance with the Conduct of Operations manual.

17.7 Restoration

Temporary modifications are removed using a work order prepared in accordance with UDS-U-GFP-0108. Activities accomplished under the work order include:

- Removing any identification tags
- Returning equipment and components to their original configuration
- Performing post-maintenance testing to ensure functionality
- Updating the temporary-modification log and form

Removal of the modification is communicated to affected personnel in accordance with the Conduct of Operations manual.

17.8 Review and Audits

All active temporary modifications are reviewed as described in UDS-U-PEP-1010 to ensure they are properly installed, identified, and in good condition. The results of this verification are noted on the temporary-modification log.

The conversion operations manager reviews active temporary modifications at least semi-annually in accordance with UDS-U-QAP-0013. Attributes evaluated during these reviews include:

- The log and forms are completed correctly
- The number of modifications is minimized
- Long-standing temporary modifications are being converted to permanent modifications
- A sample of modifications are reviewed to verify proper installation and identification, as well as satisfactory condition

18 PREPARATION FOR SEVERE WEATHER

18.1 Facility Preservation During Severe Conditions

Cold weather protection is the only severe condition that requires specific preparation activities. In lieu of a plan, procedure UDS-U-PEP-2002, *Facility Protection for Severe Weather*, provides direction on how to prepare for cold weather conditions.

18.2 Cold Weather Preparation

Procedure UDS-U-PEP-2002 establishes requirements and processes to ensure that cold weather does not adversely impact the facility or plant operations. This procedure includes a checklist that is executed prior to the onset of cold weather and a checksheet that is implemented when the temperature drops below a pre-established value.

Repetitive tasks (tracked in the computerized work order system; see Section 6) are used to prepare for cold weather each fall. Activities performed include:

- Checking anti-freeze in diesel generators
- Checking the functionality of heat trace wires for exterior piping
- Checking the functionality of area heaters
- Inspecting doors, windows, and other building openings for proper sealing
- Supplying “ice melting material” at building entrances and exits

18.3 Flash Floods and Mud Slides

Due to the topography at the two DUF_6 facilities, flash floods and mud slides are not expected.

18.4 Hurricane Watches and Warnings

Due to geographic location (Kentucky and Ohio), hurricanes are not expected.

18.5 Tornado Watches and Warnings

The DUF_6 conversion building is designed and built to maintain its structural integrity in an F-5 tornado. Emergency procedures require personnel to shelter in the conversion building when the National Weather Service declares a tornado warning. Technical Safety Requirements mandate that doors to the vaporization room be closed during a tornado warning.

18.6 Extreme Hot/Dry Weather

Activities essential to the DUF_6 project are performed inside buildings designed to withstand hot weather without any adverse impacts to operations. The areas around those facilities are maintained to resist damage from wildfires. Thus, no preparatory activities are needed during hot/dry weather.

19 REFERENCE DOCUMENTS

- 10 Code of Federal Regulations (CFR) 830, *Nuclear Safety Management*, Subpart A, "Quality Assurance Requirements"
- 48 CFR 970.5223-1, "Integration of environment, safety, and health into work planning and execution"
- DOE G 433.1-1, Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1
- DOE O 430.1B, Real Property Asset Management
- DOE O 4320.19, Conduct of Operations
- DOE O 433.1A, Maintenance Management Program for DOE Nuclear Facilities
- DOE O 450.1, Environmental Protection Program
- DOE O 5480.20A, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities
- DUF6-UDS-PLN-023, *Configuration Management Plan*
- DUF6-UDS-PLN-040, *Integrated Safety Management System – Operations*
- DUF6-U-UDS-PLN-074, *Worker Safety and Health Program*
- Job aid UDS-AD-133, *Tool Inventory and Control*
- NQA-1-2004, Quality Assurance Requirements for Nuclear Facility Applications
- UDS-EDI-003, *Preparation of Engineering Drawings*
- UDS-HRP-005, *Employee Discipline Procedure*
- UDS-PRP-007, *Blanket Purchase Orders*
- UDS-PRP-008, *Request for Proposal*
- UDS-PRP-010, *Pre-Award Survey*
- UDS-PRP-012, *Technical Evaluation of Proposals*
- UDS-PRP-016, *Processing Contractor Releases and Notification of Hold Points*
- UDS-PRP-022, *Material Receipt Control*
- UDS-SHP-203, *Hoisting and Rigging*
- UDS-SHP-213, *Industrialized Motorized Trucks*
- UDS-U-DMP-0001, *Document Control*

- UDS-U-DMP-0002, *Records Management*
- UDS-U-EDP-0012, *Design Change Control*
- UDS-U-GFP-0101, *Conversion Facility Conduct of Operations Applicability Matrix*
- UDS-U-GFP-0108, *Control of Work*
- UDS-U-NSP-0002, *Unreviewed Safety Question*
- UDS-U-PEP-1003, *Assessing System Status and System Performance*
- UDS-U-PEP-1004, *Post-Maintenance Testing*
- UDS-U-PEP-1009, *System Engineering*
- UDS-U-PEP-1010, *Control and Tracking of Temporary Modifications*
- UDS-U-PEP-2001, *M&TE*
- UDS-U-PEP-2002, *Facility Protection for Severe Weather*
- UDS-U-PRP-0002, *Purchase Requisition*
- UDS-U-PRP-0022, *Material Receipt Control*
- UDS-U-QAP-0003, *Procedure System*
- UDS-U-QAP-0005, *Condition Reporting*
- UDS-U-QAP-0013, *Management Assessments*
- UDS-U-QAP-0017, *Lessons Learned*
- UDS-U-QAP-0018, *Root Cause Analysis*
- UDS-U-SHP-0211, *Hazard Assessment*
- UDS-U-TRN-0001, *Training and Qualification*
- UDS-U-TRN-0005, *Training Implementation*
- UDS-U-TRN-0006, *Training Evaluation*

Attachment A Crosswalk of NQA-1, Subpart 1.18, to UDS Maintenance Program		
NQA-1		Program Description
Section #	Title	Section #
100	General	NA
200	General Requirements	1, 2, 5, 6, 8, 9, 10, 11, 17
201	Responsibilities	1.1
202	Procedures	5
203	Cleanliness Control	7.11
204	Environmental & Seismic Qualifications	1.9, 8, 17
205	Work Authorization	6, 7
206	Equipment History	15
207	Verification of Maintenance Work	8
208	Updating of Maintenance Procedures From Vendor Technical Manuals and Industry Bulletins	1.13
300	Preventive Maintenance	4.2
301	General	4.2
302	Plans and Procedures	4, 5
400	Corrective Maintenance	4.10
401	General	4, 6, 7
402	Identification, Reporting, and Documenting of Equipment or Systems Requiring Corrective Maintenance	4, 6, 16
403	Assessment of Evaluations	4, 16
404	Implementing Corrective Maintenance	4, 6, 7
500	Records	1.14, 4, 7, 11, 15, 16